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Research Article

Medicinal plants for kidney pain: An ethnobotanical study on Shahrekord city, West of Iran

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Abstract

Kidney problems such as kidney stones, pyelonephritis, nephropathy, diabetes, hypertension and other kidney complications can cause kidney pain. In general, opioid and non-opioid systemic analgesics are used to control pain that have many side effects such as nausea, vomiting, sedation, and respiratory depression. Studies on plants that can be useful in the treatment of kidney diseases such as kidney pain are difficult and little research has been done in this regard. Therefore, in this ethnobotanical study, plant antioxidants and medicinal plants affecting kidney pain were identified. For this purpose, a questionnaire was used to identify and obtain indigenous information and knowledge of traditional therapists in Shahrekord regarding the treatment of kidney pain. This ethnobotanical study was conducted from 21 April, 2016 to 19 February, 2017 in 29 traditional therapists of the region under purpose. Finally, the data drawn from the questionnaires were analyzed using the Excel software. In this study, the frequency of plant use was also calculated. The results of this study showed that 16 species of medicinal plants from 11 plant families in this region are used to cure kidney pain. The most frequently used are for anti-kidney pain was *Alhagi maurorum* (79%) followed by *Tribulus terrestris* (70%). Besides, the Asteraceae (5 plant species) was the largest family of medicinal plants with anti-kidney pain effect, and the flower (32%) was the most frequently used plant organ for anti-kidney pain property.

Keywords: ethnobotany; medicinal plants; urinary tract; kidney pain; Shahrekord; Iran

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Introduction

Kidney problems such as kidney stones, pyelonephritis, nephropathy, diabetes, hypertension and other kidney complications can cause kidney pain (1-3). If these diseases and complications are not treated, they can lead to serious damage even life-threatening complications and illnesses including kidney failure (4-7). The causes of kidney pain include atherosclerosis or hardening of the renal arteries due to blood clotting

or ischemia, kidney bleeding, horseshoe kidney, hydronephrosis, kidney tumors, urinary tract infection, urinary tract obstruction, etc (4-7). If the pain is severe, certain analgesics can be used to alleviate the pain until undergoing proper treatment (8, 9). In general, opioid and non-opioid systemic analgesics are used to control pain that have many side effects such as nausea, vomiting, sedation, and respiratory depression (10, 11). Finding a safe and reliable pharmaceutical source to control pain is therefore a good strategy for managing kidney pain. One of these methods is the use of medicinal plants. Medicinal plants are used in the treatment of diseases of human viscera such as the heart, kidney, liver, digestive system and genitalia, respiratory system and nervous system due to the presence of active antioxidant and medicinal substances (12-18). Studies on plants that can be useful in the treatment of kidney diseases such as kidney pain are difficult and little research has been done in this regard. Medicinal herbs used for kidney pain in different parts of Iran include *Achila mellifolium*, *Berberis vulgaris*, *Equisetum arvense*, *Alhagi persarum*, *Lycium depressum*, *Allium haemanthoides*, *Petroselinum crispum*, *Hyoscyamus orthocarpus*, *Ceratocephalus falcata*, *Malva neglecta*, and *Zizyphus jujube* (19-27). Therefore, in this ethnobotanical study, plant antioxidants and medicinal plants that are effective on kidney pain were identified.

Materials and Methods

Data collection procedure

A questionnaire was used to identify and obtain indigenous information and knowledge of traditional therapists in Shahrekord about the treatment of kidney pain. This ethnobotanical study was conducted from 21 April, 2016 to 19 February, 2017 in 29 traditional therapists of the region under study (Fig. 1. - Shahrekord map). First, a questionnaire was prepared and then filled out through face-to-face interview. The questionnaire included demographic information (location, characteristics of the interviewer, native name and used organ(s) of the plant, and education level). The interviewers referred to the respondents in person and received their pharmaceutical and ethnobotanical information and record it in the questionnaires.

Data were finally analyzed by the Excel software. In this study, the frequency of plant use was calculated by the formula given below (27).

Number of times the plant is used = (Number of people who have mentioned the plant effect divided by total number of people who filled out questionnaires) × 100

Table 1. Scientific name, family, Persian name, used organ(s) and frequency of use of medicinal plants used as anti-kidney pain agents in Shahrekord.

Sl. No.	Scientific name	family	Local name	Frequency of use	Organs used	Treatment
1	*Eugenia caryophyllata*	Myrtaceae	Mikhak	44%	Flower, stem	Kidney pain
2	*Tribulus terrestris* L.	Zygophyllaceae	Kharkhasak	70%	Aerial organs	Kidney pain
3	*Alhagi maurorum* Medik.	Fabaceae	Kharshotor	79%	Aerial organs	Kidney pain
4	*Hypericum scabrum* L.	Hypericaceae	Gole raei	3%	Flower, stem	Kidney pain
5	*Echinophora platyloba* DC.	Apiaceae	Khosharizeh	13%	Aerial organs	Kidney pain
6	*Hyoscyamus kotschyanus* Pojark.	Solanaceae	Bang daneh	2%	Seed, leaf	Kidney pain
7	*Papaver rhoeas* L.	Papaveraceae	Gole shaghaiegh	3%	Flower	Kidney pain
8	*Zingiber officinale* Roscoe	Zingiberaceae	Zanjabil	2%	Root, stem	Kidney pain
9	*Centaurea cyanus* L.	Asteraceae	Gole gandom	3%	Stem, leaf, flower	Kidney pain
10	*Tripleurospermum parviflorum* L.	Asteraceae	Babouneh kazeb	13%	Flower	Kidney pain
11	*Melissa officinalis* L.	Lamiaceae	Badranjbouyeh	3%	Aerial organs	Kidney pain
12	*Achillea millefolium* L.	Asteraceae	Boumadaran	3%	Aerial organs	Kidney pain
13	*Tanacetum polycephalum* (L.) Schultz-Bip.	Asteraceae	Mokhalaseh	3%	Aerial organs	Kidney pain
14	*Valeriana officinalis* L.	Caprifoliaceae	Sonbolatieb	3%	Flower, stem	Kidney pain
15	*Thymus vulgaris* L.	Lamiaceae	Avishan	3%	Leaf, flower	Kidney pain
16	*Hyssopus augustifolius* M.B.	Lamiaceae	Zofa	3%	Leaf, stem, flower	Kidney pain

Results

Out of 29 respondents, 8 were female and 21 male. The respondents' education level was from high school diploma to master's degree. The data drawn from the questionnaires were uniformly tabulated. The results of this study showed that 17 species of medicinal plants consisting of *Eugenia caryophyllata*, *Tribulus terrestris*, *Alhagi maurorum*, *Hypericum scabrum*, *Echinophora platyloba*, *Hyoscyamus kotschyanus*, *Papaver rhoeas*, *Zingiber officinale*, *Centaurea cyanus*, *Tripleurospermum parviflorum*, *Melissa officinalis*, *Achillea millefolium*, *Tanacetum polycephalum*, *Valeriana officinalis*, *Thymus vulgaris* and

Hyssopus augustifolius from 11 plant families in this region are used as anti-kidney pain medicinal plants according to the ethnobotanical knowledge of the region. Additional information on anti-kidney pain medicinal plants is shown in Table 1.

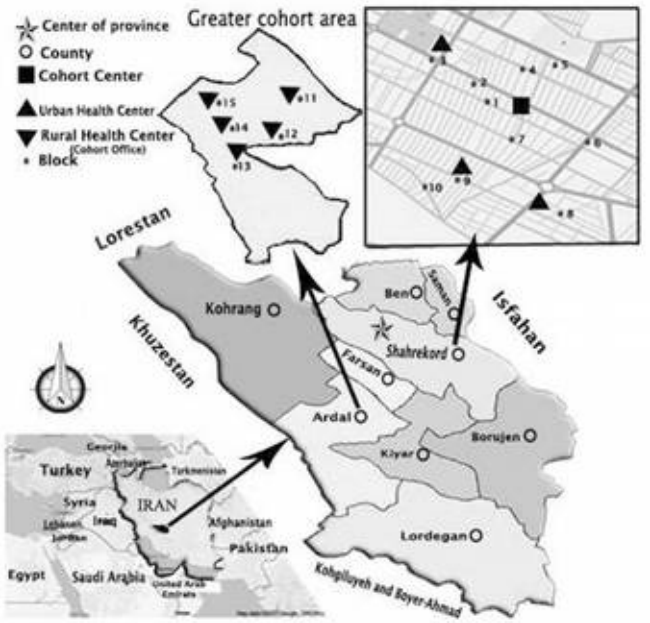

Fig. 1. Shahrekord's area map

As Table 1 shows, the most frequently used plant as anti-kidney pain medicinal plant was *Alhagi maurorum* (79%) followed by *Tribulus terrestris* 70%. Besides, the family Asteraceae (5 plant species) was the largest family of medicinal plants with anti-kidney pain effect, and the flower (32%) was the most frequently used plant organ for its anti-kidney pain property. Additional information is presented in Table 1 and illustrated in Fig. 2 and Table 2.

Table 2. The distribution of plant families for kidney pain in Shahrekord.

Family	Number
Caprifoliaceae	1
Lamiaceae	3
Asteraceae	5
Zingiberaceae	1
Papaveraceae	1
Solanaceae	1
Myrtaceae	1
Apiaceae	1
Hypericaceae	1
Fabaceae	1
Zygophyllaceae	1

Discussion

According to the ethnobotany of Shahrekord, the medicinal plants such as *Eugenia caryophyllata*, *Tribulus terrestris*, *Alhagi maurorum*, *Hypericum scabrum*, *Echinophora platyloba*, *Hyoscyamus kotschyanus*, *Papaver rhoeas*, *Zingiber officinale*, *Centaurea cyanus*, *Tripleurospermum parviflorum*, *Melissa officinalis Achillea millefolium*, *Tanacetum polycephalum*, *Valeriana officinalis*, *Thymus vulgaris* and *Hyssopus augustifolius* are used to relieve kidney pain. According to traditional medicine in different regions of Iran, various medicinal plants are used to treat kidney pain. In Abadeh, Shiraz (southern Iran), *Amygdalus oreintalis* and *Achila mellifolium* are used to treat kidney pain (19). In Arasbaran (north of Iran), the medicinal plants *Berberis vulgaris* L. and *Equisetum arvense* (20), in Ilam province (west of Iran), *Alhagi persarum* and *Lycium depressum* (21), in Khuzestan province (southwest of Iran), *Allium haemanthoides*, *Petroselinum crispum* and *Hyoscyamus orthocarpus* (22), in Sistan, *Malva neglecta* and *Alhagi persarum* (23), in Mobarakeh, Isfahan (central Iran), *Petroselinum crispum* and *Matricaria recutita* (24), in Hormozgan province (southern Iran), *Tribulus macropterus* and *Tribulus terresteris* (25) and in Hamadan (southwest of Iran), *Ceratocephalus falcata* (26) are used as a curative for kidney pain. Some medicinal plants in different regions of Iran, including those occurring in the Shahrekord region, have ani-jaundice effects. According to the results of this study and given the emphasis of traditional medicine on the anti-kidney pain effects of medicinal plants, these plants can have a preventive effect against problem, but it is necessary to investigate these effects in clinical and pharmacological studies.

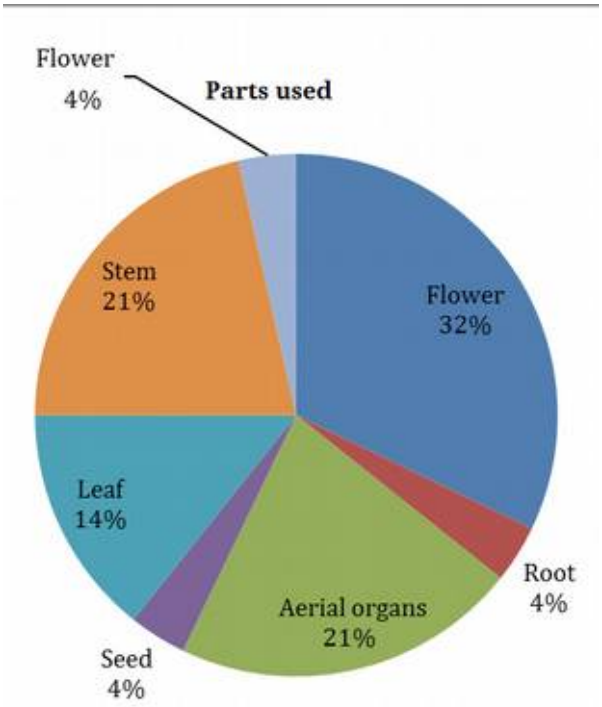

Fig. 2. The percentage of the use of plants organs with anti-kidney pain property in Shahrekord.

Conclusion

These plants might be used as alternative or complementary remedies and might be used for preparation of new drugs.

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Competing Interests

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Authors' contributions

All the authors contributed equally to the work presented in this paper.

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Appendix 1

1. Date
2. City/Village
3. Informant name and surname
4. Age
5. Degree of education
6. Family origin
7. Which wild plants do you use to treat the different ailments?
8. How you have learned to traditional information?
9. Which plant parts do you use in traditional information?
10. What is the vernacular name of these plants / part of plants in traditional information?
11. Can you describe the preparation of remedy in detail?
12. When should the medicine be taken and for how long?
13. Internal or external administration?
14. Where does this knowledge arrive from?

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